

RECLAMATION

Managing Water in the West

Draft Environmental Assessment

Contract for Conveyance of Non-Central Valley Project Water for Kern-Tulare Water District and Rag Gulch Water District

EA-07-105



U.S. Department of the Interior
Bureau of Reclamation
Mid Pacific Region
South Central California Area Office
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List of Acronyms, Abbreviations, and Definition of Terms

AF	acre-feet (the volume of water one foot deep and an acre in area)
APE	area of potential effects
Arvin Edison	Arvin Edison Water Storage District
CV	Cross Valley
CVC	Cross Valley Canal
CVP	Central Valley Project
DWR	California Department of Water Resources
EA	Environmental Assessment
ESA	Endangered Species Act
FKC	Friant-Kern Canal
FWCA	Fish & Wildlife Coordination Act
KTRG	Kern-Tulare Water District and Rag Gulch Water District
MBTA	Migratory Bird Treaty Act
MFL	Magnetic Flux Leakage
mg/L	milligrams per liter
MPN	most probable number
NEPA	National Environmental Policy Act
National Register	National Register of Historic Places
NHPA	National Historic Preservation Act
NTU	Nephelometric Turbidity Units
ppm	parts per million
Reclamation	Bureau of Reclamation
Service	U.S. Fish and Wildlife Service
SWP	State Water Project
µg/L	micrograms per liter
µS/cm	microSiemens per centimeter

Section 1 Purpose and Need for Action

1.1 Background

Kern-Tulare Water District and Rag Gulch Water District (collectively known as KTRG) are Central Valley Project (CVP) Cross Valley contractors and share common distribution facilities and staff. KTRG is located on the border of Kern and Tulare counties, east of the Friant-Kern Canal (FKC) (Figure 1-1). Kern-Tulare Water District has a contract with the Bureau of Reclamation (Reclamation) for 40,000 acre-feet (AF) of annual water supply from the Delta. Rag Gulch Water District has a contract with Reclamation for 13,300 AF of annual water supply from the Delta.

Kern-Tulare Water District has a contract with the City of Bakersfield for an average of 20,000 AF per year of Kern River water and Rag Gulch Water District has a similar contract for an average of 3,000 AF per year. Water under these contracts is delivered to the Kern County Water Agency Improvement District No. 4 in exchange for State Water Project (SWP) water. The SWP water is conveyed through the Cross Valley Canal (CVC) to the FKC, where it is exchanged with a Friant Contractor for water available in the FKC.

As stated above, KTRG are CVP Cross Valley (CV) contractors. CV Contractor's CVP supplies are available through either the FKC or in the Delta. CV Contractor deliveries from the FKC are only available when all the other Friant supplies have been met and water is available in Lake Millerton. The CV Contractor supplies are not commonly available in Lake Millerton for the CV Contractors and have only been available a handful of times in the past 20 years. When CVP supplies are available in Lake Millerton for the CV Contractors, it is for a large volume of water up to the contract quantity for only a short period of time.

CV Contractor deliveries from the Delta are typically made available by Reclamation in Clifton Court Forebay. Due to CVP conveyance constraints, these Delta supplies are not typically conveyed through CVP facilities. CVP conveyance occurs infrequently and, when it does occur, it is for a very short duration. The typical conveyance mechanism is conveyance by California Department of Water Resources (DWR).

DWR delivers the CV Contractor's CVP water through the SWP facilities to Reach 12E of the California Aqueduct. From there the CV Contractor's CVP water is typically delivered through the CVC for direct delivery and/or by exchange arrangements under Article 5 of the CVP contracts with Arvin Edison Water Storage District (Arvin Edison) or others. DWR only pumps this water from the Delta and conveys this CVP water through the California Aqueduct when, and if, all other SWP requirements have been met.

1.2 Purpose

Reclamation proposes to approve a one-year Warren Act contract for conveyance of up to 20,000 AF (up to 10,000 AF for Kern-Tulare Water District and 10,000 AF for Rag Gulch Water District) of non-CVP water for KTRG. The term of the Warren Act contract would be the 2008 water year, ending February 28, 2009. KTRG have access to the FKC and have historically requested Warren Act contracts through Reclamation. The purpose of the Warren Act contract is to allow KTRG to convey their non-CVP water through any available excess capacity in the Reclamation-owned CVP facilities in order to deliver non-CVP water during water shortages. The Proposed Action would allow direct deliveries to KTRG without requiring an exchange through a facilitating intermediary.

The Warren Act (Act as of February 21, 1911, CH. 141, (36 STAT. 925)) authorizes Reclamation to negotiate agreements to store or convey non-CVP water when excess capacity is available in federal facilities.

1.3 Need

Reclamation is predicting another dry year. KTRG needs a Warren Act contract to deliver its non-CVP water to agricultural lands within the districts at times when an exchange with Arvin Edison is not available. The exchange with Arvin Edison would not be available when Arvin Edison does not have sufficient Friant CVP water supplies to facilitate the exchange or an exchange agreement cannot be negotiated.

The five-year historic average for Friant Division agricultural water service contracts is 76 percent.

1.4 Applicable Regulatory Requirements and Required Coordination

Several Federal laws, permits, licenses and policy requirements have directed, limited or guided the NEPA analysis and decision making process of this environmental assessment and include the following:

- *Reclamation States Emergency Drought Relief Act* - Section 102 of the Reclamation States Emergency Drought Relief Act of 1991 provides for use of Federal facilities and contracts for temporary water supplies, storage and conveyance of non-CVP water inside and outside project service areas for M&I, fish and wildlife, and agricultural uses.
- *Contracts for Additional Storage and Delivery of Water* – Central Valley Improvement Act (CVPIA) of 1992, Title 34 (of Public Law 102-575), Section 3408, Additional Authorities (c) authorizes the Secretary of the Interior to enter into contracts pursuant to

Reclamation law and this title with any Federal agency California water user or water agency, State agency, or private nonprofit organization for the exchange, impoundment, storage, carriage, and delivery of Central Valley Project and non-project water for domestic, municipal, industrial, fish and wildlife, and any other beneficial purpose, except that nothing in this subsection shall be deemed to supersede the provisions of section 103 of Public Law 99-546 (100 Stat. 3051). The CVPIA is incorporated by reference.

- *Water Quality Standards* - Reclamation requires that the operation and maintenance of CVP Project facilities shall be performed in such a manner as is practical to maintain the quality of raw water at the highest level that is reasonably attainable. Water quality and monitoring requirements are established annually by Reclamation and are instituted to protect water quality in the FKC by ensuring that imported non-CVP water does not impair existing uses or negatively impact existing water quality conditions. These standards are updated periodically. The annual review for the approval of Warren Act Contracts would be subject to the then existing water quality standards. The water quality standards are the maximum concentration of certain contaminants that may occur in each source of non-CVP water. The water quality standards for non-CVP water to be pumped into the FKC are currently those set out in Title 22 of the California Code of Regulations. The standards from Title 22 can be found in Appendix A.

1.5 Potential Issues

- Water Resources
- Biological Resources
- Cultural Resources
- Indian Trust Assets
- Socioeconomic Resources
- Environmental Justice

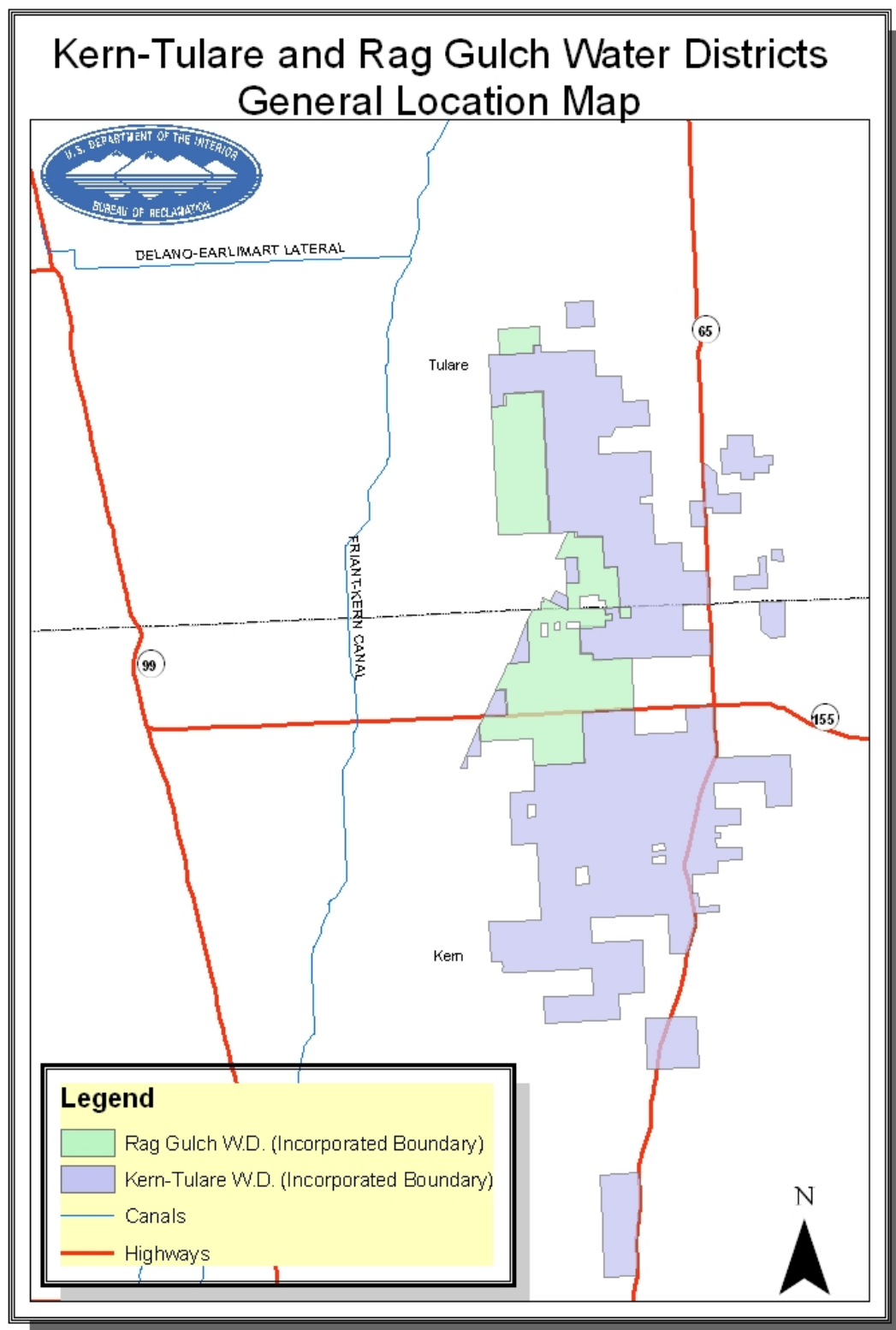


Figure 1-1 Kern Tulare and Rag Gulch Water Districts – General Location Map, Kings and Tulare County, CA

Section 2 Alternatives Including Proposed Action

For the purposes of effect analysis, baseline conditions are described as the existing environment, and the existing environment is defined as the conditions during the past five years. The five-year average of CVP water supply made available to the water contractors in the delta is described in Table 2-1. The table lists actual allocation percentages of CVP water on a yearly basis for agriculture purposes from 2003 to 2007. The five-year average is 76 percent of contract amounts for agriculture. This average does not reflect restrictions imposed by DWR delivery capabilities. The annual contract amounts for the KTRG is 53,000 AF, thus the baseline supply is 40,280 AF.

Table 2-1 5-Year CVP Allocation Percentages

5-YEAR CVP ALLOCATION PERCENTAGES	
Year	Percent Ag Allocation
2003	75
2004	70
2005	85
2006	100
2007	50
5-Year Average	76

2.1 Alternative A – No Action

Under the No Action Alternative, Reclamation would not approve Warren Act contracts and not allow non-CVP water to be conveyed to KTRG through CVP facilities. However, the water could continue to be exchanged with Arvin Edison, at their discretion, for Friant CVP water. Additionally, the No Action Alternative consists of the continuation of deliveries of CVP water supply to KTRG. Baseline conditions are the basis for analysis of the No Action Alternative.

2.2 Alternative B - Proposed Action

Reclamation proposes to execute a one-year Warren Act Contract for 2008 to convey up to 20,000 AF (up to 10,000 AF for Kern-Tulare Water District and 10,000 AF for Rag Gulch Water District) of KTRG's Kern River water and State Water Project (SWP) water available through agreements with Kern County Water Agency (KCWA), into the FKC for direct delivery to KTRG. These two sources would be introduced to the FKC from 1) the CVC through existing siphons, similar to KTRG's current operations with CVP water, or 2) the Lerdo Canal to the FKC via North Kern Water Storage District's (NKWSD) lateral.

Once water is delivered into the FKC, it can be delivered to KTRG through an intercept exchange with other districts that have demands on the FKC downstream of KTRG. To physically deliver the water all the way to KTRG would require pumping over three check structures—the Shafter Check, the Poso Creek Check, and the Lake Woollomes Check. However, the intercept exchange can usually be made with Arvin Edison, which requires no additional lifts. When Arvin Edison is not taking delivery of FKC water, it is typically necessary to pump the water over one check (Shafter Check) to make the exchange with Shafter Wasco Irrigation District.

Kern River and CVP Delta water have historically been exchanged with Arvin Edison for Friant CVP water delivered through the FKC. The difference between the No Action and the Proposed Action is that the Proposed Action would allow direct deliveries to KTRG without requiring an exchange through a facilitating intermediary, as would be required in the No Action.

Additionally, KTRG requests the flexibility to transfer and exchange some of the non-CVP water that would be pumped into the FKC amongst themselves. It is not known at this time the mechanism of these transfers and exchanges, or if they would occur at all.

Section 3 Affected Environment & Environmental Consequences

3.1 Water Resources

3.1.1 Affected Environment

Kern-Tulare and Rag Gulch Water Districts

In 1974, KTRG contracted with Reclamation for 53,300 AF of Cross Valley water entitlement from the Delta, participated in the construction of the Cross Valley Canal (CVC), and executed a long-term water exchange agreement with Arvin Edison. To convey the CVP Cross Valley water supply from the Delta, where Cross Valley water supply originates, water is wheeled through the California Aqueduct to Tupman under contract with DWR. From Tupman, the water is conveyed east in the CVC and delivered to Arvin Edison. By exchange with its Friant CVP supply, Arvin Edison makes water available to KTRG in the FKC.

In 1976, KTRG contracted with the City of Bakersfield for 23,000 AF of Kern River water. Delivery of Kern River water under this agreement is facilitated by exchanges between the City of Bakersfield, Kern County Water Agency (KCWA) Improvement District Number 4 (ID-4) and Arvin Edison.

KTRG currently has five 24-inch pipelines that connect the CVC to the FKC. Three are located on the west side of the FKC and two are located on the east side. All five of these pipelines could be used to convey water by gravity from the CVC to the FKC. The capacity of these pipelines is about 15 cubic feet per second each. The Two siphons on the east can also move water from the FKC to the CVC.

The depth to groundwater varies from about 200 feet to over 600 feet throughout KTRG. There are static groundwater levels taken in the spring and do not include the temporary drawdown of 50 to 100 feet caused by pumping. Sources of groundwater replenishment include underflow in KTRG from both the east and the west.

Wells drilled on the west side of the KTRG tap into the continental deposits. Continental deposits comprise an unconfined aquifer. Groundwater in the continental deposits contains between 250 parts per million (ppm) and 400 ppm total dissolved solids and is of a calcium bicarbonate or sodium bicarbonate chemical type. The water is classified as suitable for irrigation.

In the easterly portion of KTRG, a number of wells drilled to depths of 1,400 to 2,500 feet tap highly permeable deposits of the Santa Margarita and/or the Ocese Formations. These

formations form an unconfined aquifer and contain useable groundwater. Groundwater in these deposits is sodium chloride in character with total dissolved solids concentrations between 300 ppm and 500 ppm and is classed as having medium to high salinity hazard and high to very high sodium hazard.

The annual irrigation demand is approximately 55,000 acre-feet, of which KTRG has historically provided approximately 43,000 AF. The remaining 12,000 AF is provided by groundwater that is pumped by water users (KRTG 2003, pp. 14).

CVP Facilities

The Friant-Kern Canal carries water over 151.8 miles in a southerly direction from Millerton Lake to the Kern River, four miles west of Bakersfield. The water is used for supplemental and new irrigation supplies in Fresno, Tulare, and Kern Counties. Construction of the canal began in 1945 and was completed in 1951. The canal has an initial capacity of 5,000 cubic feet per second that gradually decreases to 2,000 cubic feet per second at its terminus in the Kern River (Reclamation 2007).

3.1.2 Environmental Consequences

No Action

Under the No Action Alternative, KTRG would continue to receive their non-CVP water through a facilitating intermediary. There would be no construction or modification to either the CVC or the FKC. The capacity of the facilities would remain the same. Thus, there would be no effects to either facility.

Proposed Action

Under the Proposed Action, Reclamation would convey the non-CVP water for KTRG in the Friant Division facilities when capacity is available. This would not alter water rights held by the United States to divert CVP water from the San Joaquin River. The introduction of this non-CVP water into CVP facilities would not cause any substantial degradation to water quality; water deliveries are anticipated to be consistent with the water quality standards identified in Appendix A.

Approval for the proposed Warren Act Contracts would not result in changes to baseline conditions. The Warren Act Contracts would expire on February 28, 2009, thus there would be no long-term effects. The quantity of non-CVP water that would be conveyed is limited to 10,000 AF. The CVP water supply available for water year 2008 for the area is estimated to be 40,280 AF (76 percent agriculture allocation). Collectively, these amounts fall within the baseline condition.

The Proposed Action does not involve any construction activities, therefore the FKC and CVC would not be affected by the project.

3.2 Land Use

3.2.1 Affected Environment

KTRG are located east of the City of Delano in both Kern and Tulare counties and together encompass 23,069 acres. Kern-Tulare and Rag Gulch Water Districts were formed in 1974 and 1955, respectively. The two districts are operated by a common staff, and are considered one district for purposes of this analysis.

Of the 23,069 acres located within KTR, 17,200 acres are currently irrigated and receive district water service. At the present time, all irrigated lands are planted to high-value permanent crops. A summary of the land use in 2005 is presented in Table 3-1 below.

KTRG physically take delivery of water from the FKC and distribute it to landowners through a distribution system consisting of 12 pumping plants and approximately 70 miles of pipelines. All water delivered to KTRG is pumped up-slope from the FKC.

2005 Land Use Summary for KTRG			
	Kern-Tulare	Rag Gulch	Total
Almonds	702	133	835
Apples	5	0	5
Blueberries	0	89	89
Cherries	98	0	98
Grapes	3,626	3,271	6,897
Grapefruit	10	0	10
Kiwi	201	0	201
Lemons	125	0	125
Olives	204	0	204
Oranges	5,913	885	6,798
Persimmons	17	0	17
Pistachios	1,626	270	1,896
Pomegranates	25	0	25
Total Irrigated	12,552	4,648	17,200
Non-irrigated	4,563	1,306	5,869
Total	17,115	5,954	23,069

Table 3-1 2005 Land Use Summary for KTRG

3.2.2 Environmental Consequences

No Action

Under the No Action Alternative, there are no changes to land use, as the water would continue to be delivered, through a facilitating intermediary, to KTRG for existing agriculture use.

Proposed Action

The Proposed Action would not result in increased or decreased water supplies in KTRG that would induce growth or land use changes as both districts are fully built out and supply no water to customers other than agricultural users. The conveyance of the non-CVP water through CVP facilities would not contribute to changes in land use. It would be conveyed in existing facilities and canals to existing agricultural lands. No excavation or construction is required to convey the water and no untilled land would be cultivated with this water.

3.3 Biological Resources

3.3.1 Affected Environment

By the mid-1940's, most of the valley's native habitat had been altered by man and, as a result, severely degraded or destroyed. The U.S. Fish and Wildlife Service (Service) estimated that more than 85 percent of the valley's wetlands had been lost by 1939 (USFWS 1989). When the CVP began operations, more than 30 percent of all natural habitats in the Central Valley and surrounding foothills had been converted to urban and agricultural land use (Reclamation 1999).

Prior to widespread agriculture, land within the proposed action area provided habitat for a variety of plants and animals. With the advent of irrigated agriculture and urban development over the last 100 years, many species have become threatened and endangered because of habitat loss. Of approximately 5.6 million acres of valley grasslands and San Joaquin saltbrush scrub, the primary natural habitats across the valley, less than 10 percent remains today. Much of the remaining habitat consists of isolated fragments supporting small, highly vulnerable populations (Reclamation 1999).

Potentially Affected Listed and Proposed Species for Kern-Tulare Water District

The following federally listed, proposed and candidate species potentially occurring in Kern-Tulare Water District was obtained on December 18, 2007 by accessing the U.S. Fish and Wildlife Database: http://www.fws.gov/pacific/sacramento/es/spp_lists/ (document number 071218111405). The list is for the Deepwell Ranch, McFarland, North of Oildale, Famoso, Delano East and Richgrove 7 ½ minute U.S. Geological Survey quadrangles, which are overlapped by Kern-Tulare Water District. For birds, a county-wide list was obtained on December 18, 2007 (document number 071218111643) for Kern and Tulare County. Also listed is a species protected by the Migratory Bird Treaty Act (MBTA).

Invertebrates

Branchinecta lynchi – vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus – valley elderberry longhorn beetle (T)

Fish

Hypomesus transpacificus – delta smelt (T)

Amphibians

Rana aurora draytonii – California red-legged frog (T)

Reptiles

Gambelia silus – blunt-nosed leopard lizard (E)

Thamnophis gigas – giant garter snake (T)

Birds

Athene cunicularia hypugea – western burrowing owl (MBTA)

Charadrius alexandrinus novosus – western snowy plover (T) (Kern County)

Empidonax traillii extimus – southwestern willow flycatcher (E) (Kern County)

Gymnogyps californianus – California condor (E) (Kern and Tulare Counties)

Vireo bellii pusillus – least Bell's vireo (E) (Kern County)

Mammals

Dipodomys ingens – giant kangaroo rat (E)

Dipodomys nitratoideus nitratoideus – Tipton Kangaroo rat (E)

Vulpes macrotis mutica – San Joaquin kit fox (E)

Plants

Pseudobahia peirsonii – San Joaquin adobe sunburst (T)

Opuntia treleasei – Bakersfield cactus (E)

Potentially Affected Listed and Proposed Species for Rag Gulch Water District

The following federally listed, proposed and candidate species potentially occurring in Rag Gulch Water District was obtained on December 18, 2007 by accessing the U.S. Fish and Wildlife Database: http://www.fws.gov/pacific/sacramento/es/spp_lists/ (document number 071218111535). The list is for the Deepwell Ranch, Delano East and Richgrove 7 ½ minute U.S. Geological Survey quadrangles, which are overlapped by Rag Gulch Water District. For birds, a county-wide list was obtained on December 18, 2007 (document number 071218111643) for Kern and Tulare County. Also listed is a species protected by the MBTA.

Invertebrates

Branchinecta lynchi – vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus – valley elderberry longhorn beetle (T)

Fish

Hypomesus transpacificus – delta smelt (T)

Amphibians

Rana aurora draytonii – California red-legged frog (T)

Reptiles

Gambelia silus – blunt-nosed leopard lizard (E)

Thamnophis gigas – giant garter snake (T)

Birds

Athene cunicularia hypugea – western burrowing owl (MBTA)

Charadrius alexandrinus novosus – western snowy plover (T) (Kern County)

Empidonax traillii extimus – southwestern willow flycatcher (E) (Kern County)

Gymnogyps californianus – California condor (E) (Kern and Tulare Counties)

Vireo bellii pusillus – least Bell's vireo (E) (Kern County)

Mammals

Dipodomys nitratoideus nitratoideus – Tipton Kangaroo rat (E)

Vulpes macrotis mutica – San Joaquin kit fox (E)

Plants

Pseudobahia peirsonii – San Joaquin adobe sunburst (T)

Critical Habitat within KTRG

“Critical habitat” is defined in section 3(5)(A) of the Federal Endangered Species Act and includes:

- Areas within a listed species' current (at time of listing) range that contain the physical or biological features that are essential to that species' conservation or that for some reason require special management; and areas outside the species' current range that the Secretary of the Interior determines to be essential to its conservation.

Primary constituent elements are those physical and biological features of designated or proposed critical habitat essential to the conservation of the species, including, but not limited to:

- Space for individual and population growth, and for normal behavior;
- Food, water, air, light, minerals, or other nutritional or physiological requirements;
- Cover or shelter;
- Sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and
- Habitats that are protected from disturbance or are representative of the historic geographic and ecological distribution of a species (ESA §3(5)(A)(i), 50 CFR §424.12(b)).

No critical habitats occur within KTRG, where under the Proposed Action Alternative the non-CVP water would be delivered. Critical habitat for the delta smelt does appear on quad lists for the districts. Designated and proposed critical habitats were queried from the Service's website: http://www.fws.gov/pacific/sacramento/es/spp_lists/.

3.3.2 Environmental Consequences

No Action

Under the No Action Alternative there are no impacts to wildlife and special status species, as no new facilities would be constructed and existing deliveries would continue to operate as has historically occurred. The conditions of special status wildlife species and habitats under the No Action Alternative would be the same as they would be under existing conditions described in the Affected Environment; therefore, no additional affects to special status species or critical habitats are associated with this alternative.

Proposed Action

The Proposed Action would not result in an increase of surface water delivered to KTRG. Only the method of conveyance would change. The water would be used to irrigate existing crops. The Proposed Action would sustain existing agricultural lands within KTRG resulting in no affects on listed or other status species. The conveyance of non-CVP water to KTRG would have no affect on species of special concern due to the small amount of water involved in the action versus the large amount of water routinely conveyed through the FKC. Additionally, no change in diversions of water from the San Joaquin River would occur as a result of the Proposed Action; therefore, there would be no affects on the delta smelt or any of the primary constituents of its designated critical habitat.

Transfers may occur between these contractors. It is not known at this time if any transfers would occur. Future water transfers must comply with the Endangered Species Act.

3.4 Cultural Resources

3.4.1 Affected Environment

Cultural resources is a term used to describe both ‘archaeological sites’ depicting evidence of past human use of the landscape and the ‘built environment’ which is represented in structures such as dams, roadways, and buildings. The National Historic Preservation Act (NHPA) of 1966 is the primary Federal legislation which outlines the Federal Government’s responsibility to cultural resources. Other applicable cultural resources laws and regulations that could apply include, but are not limited to, the Native American Graves Protection and Repatriation Act, and the Archaeological Resources Protection Act. Section 106 of the NHPA requires the Federal Government to take into consideration the effects of an undertaking listed on cultural resources on or eligible for inclusion in the National Register of Historic Places (National Register). Those resources that are on or eligible for inclusion in the National Register are referred to as historic properties.

The Section 106 process is outlined in the Federal regulations at 36 CFR Part 800. These regulations describe the process that the Federal agency (Reclamation) takes to identify cultural

resources and the level of effect that the proposed undertaking will have on historic properties. In summary, Reclamation must first determine if the action is the type of action that has the potential to affect historic properties. If the action is the type of action to affect historic properties, Reclamation must identify the area of potential effects (APE), determine if historic properties are present within that APE, determine the effect that the undertaking will have on historic properties, and consult with the State Historic Preservation Office, to seek concurrence on Reclamation's findings. In addition, Reclamation is required through the Section 106 process to consult with Indian Tribes concerning the identification of sites of religious or cultural significance, and consult with individuals or groups who are entitled to be consulting parties or have requested to be consulting parties.

The CVP is being evaluated for the National Register. Facilities include the Friant Dam and the Friant-Kern Canal. Friant Dam is located on the San Joaquin River, 25 miles northeast of Fresno, CA. Completed in 1942, the dam is a concrete gravity structure, 319 feet high, with a crest length of 3,488 feet. The Friant-Kern Canal carries water over 151.8 miles in a southerly direction from Millerton Lake to the Kern River, four miles west of Bakersfield. The water is used for supplemental and new irrigation supplies in Fresno, Tulare, and Kern Counties. Construction of the canal began in 1945 and was complete in 1951 (Reclamation 2006).

3.4.2 Environmental Consequences

No Action

Under the No Action Alternative, would not change nor modify the FKC and has no potential to affect historic properties pursuant to 36 CFR Part 800.3(a)(1).

Proposed Action

The proposed action is an administrative action that would allow for the flow of water through existing facilities to existing users. There is no ground disturbance or modification needed to the existing facilities as a result of this action. As a result there is no potential to affect historic properties pursuant to 36 CFR Part 800.3(a)(1). There are no impacts to cultural resources as a result of implementing the proposed action.

3.5 Indian Trust Assets

3.5.1 Affected Environment

Indian Trust Assets are legal interests in property or rights held in trust by the United States for Indian Tribes or individual Native Americans. Trust status originates from rights imparted by treaties, statutes, or executive orders. Such assets cannot be sold, leased or otherwise alienated without Federal approval.

Indian reservations, ranches, and allotments are common Indian Trust Assets. Allotments are parcels of land held in trust for specific individuals that may be located outside reservation boundaries. In addition, such assets include the right to access certain traditional areas and perform traditional ceremonies. There are no Indian Trust Assets in KTRG.

Environmental Consequences

No Action

Under the No Action Alternative there are no impacts to Indian Trust Assets, since conditions would remain the same as existing conditions.

Proposed Action

There are no tribes possessing legal property interests held in trust by the United States in the water involved with this action, nor is there such a property interest in the lands designated to receive the water proposed in this action.

3.6 Socioeconomic Resources

3.6.1 Affected Environment

KTRG consists of primarily rural agricultural lands. There are many communities across the area that are homes for farm workers. There are many small businesses that support agriculture such as feed and fertilizer sales, machinery sales and service, pesticide applicators, transport, packaging, and marketing. Numerous other businesses, institutions, and governmental agencies provide further support to the area (Kern 2005).

3.6.2 Environmental Consequences

No Action

Under the No Action Alternative there would be no substantial impacts to the quality of the human environment, public health or safety. Without this water there may be a minor drop in employment if there is a reduction in agriculture production. This decreased amount would be small and would not result in substantial impacts to socioeconomic resources.

Proposed Action

Neither alternative would cause any harm to the quality of the human environment nor have adverse effects on public health or safety. KTRG is responsible for obtaining and managing water for the benefit of its landowners in consideration of local economic conditions and employment.

Under the Proposed Action Alternative, KTRG could rely on its supply of non-CVP water for district operations without the need for a facilitating intermediary. There would be no adverse social or economic impacts.

3.7 Environmental Justice

3.7.1 Affected Environment

Executive Order 12898, dated February 11, 1994, requires Federal agencies to ensure that their actions to no disproportionately impact minority and disadvantaged populations. The population of some small communities typically increases during late summer harvest. The market for seasonal workers on local farms draws thousands of migrant workers, commonly of Hispanic origin from Mexico and Central America.

3.7.2 Environmental Consequences

No Action

The No Action Alternative would continue to result in minor increased costs and some decreased reliability of providing water to KTRG's district operations.

Proposed Action

The Proposed Action would no cause dislocation, changes in employment, or increase flood, drought, or disease. The Proposed Action would not disproportionately impact economically disadvantaged or minority populations. There would be no changes to existing conditions. Employment opportunities for low-income wage earners and minority population groups would be within historical conditions. Disadvantaged populations would not be subject to disproportionate impacts. A Warren Act contract would continue to allow KTRG to use its non-CVP water for irrigation. Providing the flexibility for KTRG to independently manage its non-CVP water deliveries would be beneficial to stabilizing its district operations from year to year.

3.8 Cumulative Impacts

The diversion of non-CVP water by KTRG is currently conducted independently from CVP operations and could occur without a Warren Act contract. Reclamation has conveyed non-CVP water in CVP facilities for KTRG in the past.

The primary cumulative effect is the elimination of the need for a facilitating intermediary to deliver KTRG's non-CVP water to the districts. Non-CVP water would be transported pursuant to a Warren Act contract and would be distributed using existing conveyance facilities, including the FKC, CVC, and Kern River, and turnouts and distribution facilities within KTRG.

The approval would not establish a precedent for future actions. Reclamation has approved the same action for years 2002 to 2007. Approval would not have highly controversial or uncertain environmental effects or involve unique or unknown environmental risks. Current Reclamation policy only permits temporary Warren Act contracts at its discretion. Reclamation is under no legal obligation to execute these contracts. Overall operation of the Project is the subject of a programmatic environmental impact statement.

As previously noted, the approval to be covered under this Environmental Assessment would be for one year and would be limited to uses of this non-CVP water with no resulting land use changes.

Section 4 Consultation and Coordination

4.1 Fish and Wildlife Coordination Act (16 USC . 651 et seq.)

The Fish and Wildlife Coordination Act (FWCA) requires that Reclamation consult with fish and wildlife agencies (federal and state) on all water development projects that could affect biological resources. The Proposed Action does not involve construction projects. Therefore, the FWCA does not apply.

4.2 Endangered Species Act (16 USC. 1521 et seq.)

Section 7 of the Endangered Species Act requires Federal agencies to ensure that all federally associated activities within the United States do not jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of the critical habitat of these species. Action agencies must consult with the Service, which maintains current lists of species that have been designated as threatened or endangered, to determine the potential impacts a project may have on protected species.

The Proposed Action would support existing uses and conditions. No native lands would be converted or cultivated with this water. The water would be delivered to existing agricultural lands, through existing facilities, as has been done in the past, and would not be used for land conversion. Therefore, the Proposed Action would have no affect on federally listed threatened or endangered species or their designated habitats.

4.3 National Historic Preservation Act (15 USC 470 et seq.)

Section 106 of the National Historic Preservation Act requires federal agencies to evaluate the affects of federal undertakings on historical, archaeological and cultural resources. Due to the nature of the proposed project, there would be no affect on any historical, archaeological or cultural resources, and no further compliance actions are required.

4.4 Migratory Bird Treaty Act (16 USC Sec. 703 et seq.)

The Migratory Bird Treaty Act implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Unless permitted by regulations, the Act provides that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. Subject to limitations in the Act, the Secretary of the Interior (Secretary) may adopt regulations determining the extent to which, if at all, hunting, taking, capturing, killing, possessing, selling, purchasing, shipping, transporting or exporting of

any migratory bird, part, nest or egg will be allowed, having regard for temperature zones, distribution, abundance, economic value, breeding habits and migratory flight patterns.

The Proposed Action would have no effect on birds protected by the Migratory Bird Treaty Act.

4.5 Executive Order 11988 – Floodplain Management and Executive Order 11990 - Protection of Wetlands

Executive Order 11988 requires Federal agencies to prepare floodplain assessments for actions located within or affecting flood plains, and similarly, Executive Order 11990 places similar requirements for actions in wetlands. This action would not adversely affect floodplains or wetlands.

Section 6 List of Preparers and Reviewers

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Section 7 References

- Kern County. 2005. *County of Kern Community and Economic Development Department Economic Development Strategy Final Report*. April 2005. Prepared by ICF Consulting, San Francisco, CA. Prepared for County of Kern, Community and Economic Development Department, Bakersfield, CA.
- KTRG. 2003. *Kern-Tulare Water District & Rag Gulch Water District: Water Management Plan*. May 20, 2003.
- Reclamation. 1999. Final Programmatic Environmental Impact Statement. September 1999.
- Reclamation. 2007. United States Bureau of Reclamation. Available: <http://www.usbr.gov/dataweb/html/friant.html>. Accessed: 2007.
- USFWS. June 1989. Wetlands of the California Central Valley: Status and Trends – 1939 to Mid-1980's – 28 pgs.

Appendix A – Water Quality

Warren Act Contract No. _____

Kern-Tulare & Rag Gulch Water Districts

Water Quality Monitoring Program

Quality Assurance Project Plan

Table 1. Sampling Locations

Friant-Kern Canal	
Mile Post	Location
0.46	Friant Road (Baseline site)
120.05	Woolomes Road (Baseline site)
132.45	Farm Bridge
133.42	Discharge Pipe from North Kern WSD
134.44	Beardley Canal
	Kimberlina Ave bridge
152.10	Siphon from Cross Valley Canal

Warren Act Contract No. _____

Kern-Tulare & Rag Gulch Water Districts

Water Quality Monitoring Program

Quality Assurance Project Plan

Table 2. Water Quality Sampling Schedule

Friant-Kern Canal		Title 22 Laboratory Analyses (3)	Bacterial (4)	Field Measurements
Mile Post	Location			
120.05	Woolomes Road (1)	Quarterly	Quarterly	
132.45	Farm Bridge			Weekly (2)
133.42	Discharge Pipe from North Kern WSD	Annual	Annual	
134.44	Beardley Canal			Weekly (2)
	Kimberlina Ave bridge			
152.10	Siphon from Cross Valley Canal	None	None	None

Notes:

(1) Reclamation Baseline Program

(2) As required

(3) California Code of Regulations, Title 22 Social Security, Div. 4 Environmental Health, Ch. 15 Domestic Water Quality and Monitoring Requirements

(4) Bacterial - Cryptosporidium, Fecal Coliform, Giardia, Total Coliform

Revised: 3/21/2007

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Kern-Tulare & Rag Gulch Water Districts
Water Quality Monitoring Program
Quality Assurance Project Plan

Table 3a. Water Quality Constituents

CONSTITUENT OR PARAMETER	Units	Recommended Method	California DHS Maximum Contaminant Level	Note	CAS Registry Number
Primary Constituents (CCR § 64431)					
Aluminum	µg/L	EPA 200.7	1,000	1	7429-90-5
Antimony	µg/L	EPA 200.8	6	1	7440-36-0
Arsenic	µg/L	EPA 200.8	50	16	7440-38-2
Asbestos	MFL > 10µm	EPA 100.2	7	1, 18	1332-21-4
Barium	µg/L	EPA 200.7	1,000	1	7440-39-3
Beryllium	µg/L	EPA 200.7	4	1	7440-41-7
Cadmium	µg/L	EPA 200.7	5	1	7440-43-9
Chromium (total)	µg/L	EPA 200.7	50	1	7440-47-3
Cyanide	µg/L	EPA 335.4	150	1	57-12-5
Fluoride	µg/L	EPA 300.1	2,000	1, 19	16984-48-8
Mercury (inorganic)	µg/L	EPA 245.1	2	1	7439-97-6
Nickel	µg/L	EPA 200.7	100	1	7440-02-0
Nitrate (as NO ₃)	mg/L	EPA 300.1	45	1, 20	7727-37-9
Total Nitrate + Nitrite (as Nitrogen)	mg/L	EPA 353.2	10	1	
Nitrite (as Nitrogen)	mg/L	EPA 300.1	1	1	14797-65-0
Selenium	µg/L	EPA 200.8	50	1	7782-49-2
Thallium	µg/L	EPA 200.8	2	1	7440-28-0
Secondary Constituents (CCR § 64449)					
Aluminum	µg/L	EPA 200.7	200	6	7429-90-5
Chloride	mg/L	EPA 300.1	250	7, 21	16887-00-6
Color	units	SM 2120 B	15	6	
Copper	µg/L	EPA 200.7	1,000	6	7440-50-8
Foaming agents (MBAS)	µg/L	SM 5540 C	500	6	
Iron	µg/L	EPA 200.7	300	6	7439-89-6
Manganese	µg/L	EPA 200.7	50	6	7439-96-5
Methyl-tert-butyl ether (MtBE)	µg/L	EPA 524.2	5	6	1634-04-4
Odor - Threshold	threshold units	SM 2150 B	3	6	
Silver	µg/L	EPA 200.7	100	6	7440-22-4
Specific conductance (EC)	µS/cm	SM 2510 B	900	7, 23	
Sulfate	mg/L	EPA 300.1	250	7, 21	14808-79-8
Thiobencarb	µg/L	EPA 525.2	1	6	28249-77-6
Total dissolved solids (TDS)	mg/L	SM 2540 C	500	7, 24	
Turbidity	NTU	EPA 180.1	5	6	
Zinc	µg/L	EPA 200.7	5,000	6	7440-66-8

Table 3a. Water Quality Constituents

Table 3a. Water Quality Constituents			California DHS Maximum Contaminant Level	CAS Registry Number
CONSTITUENT OR PARAMETER	Units	Recommended Method		Note
Other required analyses (CCR § 64449 (b)(2); CCR § 64670)				
Bicarbonate	mg/L	SM 2320B		8
Calcium	mg/L	SM3111B		8,12 7440-70-2
Carbonate	mg/L	SM 2320B		8
Copper	mg/L	EPA 200.7	1.3	14, 22 7440-50-8
Hardness	mg/L	SM 2340 B		8
Hydroxide alkalinity	mg/L	SM 2320B		8,12
Lead	µg/L	EPA 200.8	15	14, 22 7439-92-1
Magnesium	mg/L	EPA 200.7		8 7439-95-4
Orthophosphate	mg/L	EPA 365.1		12
pH	units	EPA 150.1	6.5 - 8.5	8, 12, 25
Silica	mg/L	EPA 200.7		12
Sodium	mg/L	EPA 200.7	69	8, 26 7440-23-5
Temperature	degrees C	SM 2550		12
Radiochemistry (CCR § 64442)				
Radioactivity, Gross Alpha	pCi/L	SM 7110C	15	3
Microbiology				
Cryptosporidium	org/liter		No MCL, measure for presence (surface)	
Fecal Coliform	MPN/100ml		No MCL, measure for presence (surface)	
Giardia	org/liter		No MCL, measure for presence (surface)	
Total Coliform bacteria	MPN/100ml		No MCL, measure for presence (surface)	
Organic Constituents (CCR § 64444)				
EPA 504.1 method				
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	EPA 504.1	0.2	4 96-12-8
Ethylene dibromide (EDB)	µg/L	EPA 504.1	0.05	4 206-93-4
EPA 505				
Chlordane	µg/L	EPA 505	0.1	4 57-74-9
Endrin	µg/L	EPA 505	2	4 72-20-8
Heptachlor	µg/L	EPA 505	0.01	4 76-44-8
Heptachlor epoxide	µg/L	EPA 505	0.01	4 1024-57-3
Hexachlorobenzene	µg/L	EPA 505	1	4 118-74-1
Hexachlorocyclopentadiene	µg/L	EPA 505	50	4 77-47-4
Lindane (gamma-BHC)	µg/L	EPA 505	0.2	4 58-89-9
Methoxychlor	µg/L	EPA 505	30	4 72-43-5
Polychlorinated biphenyls	µg/L	EPA 505	0.5	4 1336-36-3
Toxaphene	µg/L	EPA 505	3	4 8001-35-2
EPA 508 Method				
Alachlor	µg/L	EPA 508.1	2	4 15972-60-8
Atrazine	µg/L	EPA 508.1	1	4 1912-24-9
Simazine	µg/L	EPA 508.1	4	4 122-34-9

Table 3a. Water Quality Constituents

CONSTITUENT OR PARAMETER	Units	Recommended Method	California DHS Maximum Contaminant Level	Note	CAS Registry Number
EPA 515.1-4 Method					
Bentazon	µg/L	EPA 515	18	4	25057-89-0
2,4-D	µg/L	EPA 515.1-4	70	4	94-75-7
Dalapon	µg/L	EPA 515.1-4	200	4	75-99-0
Dinoseb	µg/L	EPA 515.1-4	7	4	89-85-7
Pentachlorophenol	µg/L	EPA 515.1-4	1	4	87-86-5
Picloram	µg/L	EPA 515.1-4	500	4	1918-02-1
2,4,5-TP (Silvex)	µg/L	EPA 515.1-4	50	4	93-72-1
EPA 524.2 Method (Volatile Organic Chemicals)					
Benzene	µg/L	EPA 524.2	1	4	71-43-2
Carbon tetrachloride	µg/L	EPA 524.2	0.5	4	56-23-5
1,2-Dibromoethane	µg/L	EPA 524.2	0.05		106-93-4
1,2-Dichlorobenzene	µg/L	EPA 524.2	600	4	95-50-1
1,4-Dichlorobenzene	µg/L	EPA 524.2	5	4	106-46-7
1,1-Dichloroethane	µg/L	EPA 524.2	5	4	75-34-3
1,2-Dichloroethane	µg/L	EPA 524.2	0.5	4	107-06-2
1,1-Dichloroethylene	µg/L	EPA 524.2	6	4	75-35-4
cis-1,2-Dichloroethylene	µg/L	EPA 524.2	6	4	156-59-2
trans-1,2-Dichloroethylene	µg/L	EPA 524.2	10	4	156-60-5
Dichloromethane	µg/L	EPA 524.2	5	4	75-09-2
1,2-Dichloropropane	µg/L	EPA 524.2	5	4	78-87-5
1,3-Dichloropropene	µg/L	EPA 524.2	0.5	4	542-75-6
Ethylbenzene	µg/L	EPA 524.2	300	4	100-41-4
Methyl-tert-butyl ether (MtBE)	µg/L	EPA 524.2	13	4	1634-04-4
Monochlorobenzene	µg/L	EPA 524.2	70	4	108-90-7
Styrene	µg/L	EPA 524.2	100	4	100-42-5
1,1,2,2-Tetrachloroethane	µg/L	EPA 524.2	1	4	79-34-5
Tetrachloroethylene (PCE)	µg/L	EPA 524.2	5	4	127-18-4
Toluene	µg/L	EPA 524.2	150	4	108-88-3
1,2,4-Trichlorobenzene	µg/L	EPA 524.2	5	4	120-82-1
1,1,1-Trichloroethane	µg/L	EPA 524.2	200	4	71-55-6
1,1,2-Trichloroethane	µg/L	EPA 524.2	5	4	79-00-5
Trichloroethylene (TCE)	µg/L	EPA 524.2	5	4	79-01-6
Trichlorofluoromethane	µg/L	EPA 524.2	150	4	75-69-4
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	EPA 524.2	1,200	4	76-13-1
Total Trihalomethanes	ug/L	EPA 524.2	80	10	
Vinyl chloride	µg/L	EPA 524.2	0.5	4	75-01-4
Xylene(s)	µg/L	EPA 524.2	1,750	4	1330-20-7
EPA 525.2 Method					
Benzo(a)pyrene	µg/L	EPA 525.2	0.2	4	50-32-8
Di(2-ethylhexyl)adipate	µg/L	EPA 525.2	400	4	103-23-1
Di(2-ethylhexyl)phthalate	µg/L	EPA 525.2	4	4	117-81-7
Molinate	µg/L	EPA 525.2	20	4	2212-67-1
Thiobencarb	µg/L	EPA 525.2	70	4	28249-77-6

Table 3a. Water Quality Constituents

CONSTITUENT OR PARAMETER	Units	Recommended Method	California DHS Maximum Contaminant Level	Note	CAS Registry Number
EPA 531.1 Method					
Carbofuran	µg/L	EPA 531.1-2	18	4	1563-66-2
Oxamyl	µg/L	EPA 531.1-2	50	4	23135-22-0
EPA 547 Method					
Glyphosate	µg/L	EPA 547	700	4	1071-83-6
EPA 548.1 Method					
Endothal	µg/L	EPA 548.1	100	4	145-73-3
EPA 549.2 Method					
Diquat	µg/L	EPA 549.2	20	4	85-00-7
EPA 613 Method					
2,3,7,8-TCDD (Dioxin)	µg/L	EPA 1613	0.00003	4	1746-01-6

Source Data:

Adapted from Marshack, Jon B. August 2003. A Compilation of Water Quality Goals. Prepared for the California Environmental Protection Agency, Regional Water Quality Control Board. Tables revised August 2007.

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Table 3b. Unregulated Chemicals (CCR § 64450)

CONSTITUENT OR PARAMETER	Units	Recommended Method	California Department of Health Services			CAS Registry Number
			Notification Level	Note	Response Level	
Boron	mg/L	EPA 200.7	1	9, 17, 28	10	7440-42-8
n-Butylbenzene	µg/L	EPA 524.2	260	17, 28	600	104-51-8
sec-Butylbenzene	µg/L	EPA 524.2	260	17, 28	2,500	135-98-8
tert-Butylbenzene	µg/L	EPA 524.2	260	17, 28	2,500	98-06-6
Carbon disulfide	µg/L		160	17, 28	1,600	
Chlorate	µg/L	EPA 300.1	0.8	17, 28	8	
2-Chlorotoluene	µg/L	EPA 524.2	140	17, 28	1,400	95-49-8
4-Chlorotoluene	µg/L	EPA 524.2	140	17, 28	1,400	106-43-4
Dichlorofluoromethane (Freon 12)	µg/L	EPA 524.2	1,000	9, 17, 28	10,000	75-43-4
1,4-Dioxane	µg/L	SM 8270	3	17, 27, 28	300	123-91-1
Ethylene glycol	µg/L	SM 8015	14,000	17, 28	140,000	107-21-1
Formaldehyde	µg/L	SM 6252	100	17, 28	1,000	50-00-0
n-Propylbenzene	µg/L		260	17, 28	2,600	
HMX	µg/L	SM 8330	350	17, 28	3,500	2691-41-0
Isopropylbenzene	µg/L		770	17	7,700	
Manganese	µg/L		50	17, 28	5,000	
Methyl isobutyl ketone	µg/L		120	17, 28	1,200	
Napthalene	µg/L	EPA 524.2	17	17, 28	170	91-20-3
n-nitrosodiethylamine (NDEA)	µg/L	1625	0.01	17, 28, 37	0	
n-nitrosodimethylamine (NDMA)	µg/L	1625	0.01	17, 27, 28	0	
n-nitroso-n-propylamine (NDPA)	µg/L	1625	0.01	17, 27, 28	1	
Perchlorate	µg/L	EPA 314	6	9, 17, 38	60	13477-36-6
Propachlor	µg/L	EPA 507 or 525	90	17, 28	900	1918-16-7
p-Isopropyltoluene	µg/L	EPA 524.2	770	17	7,700	99-67-6
RDX	µg/L	SM 8330	0.30	17, 27, 28	30	121-82-4
tert-Butyl alcohol (ethanol)	µg/L	EPA 524.2	12	9, 17	1,200	75-65-0
1,2,3-Trichloropropane (TCP)	ug/L	EPA 524.2	0.005	9, 17, 27, 28	1	96-18-4
1,2,4-Trimethylbenzene	µg/L	EPA 524.2	330	17, 28	3,300	95-63-6
1,3,5-Trimethylbenzene	µg/L	EPA 524.2	330	17, 28	3,300	95-63-6
2,4,6-Trinitrotoluene (TNT)	µg/L	SM 8330	1	17, 27, 28	100	
Vanadium	µg/L	EPA 286.1	50	9, 17	500	7440-62-2
Chromium VI	µg/L	EPA 200.7	100	9, 17, 26		18540-29-9
Ethyl-tert-butyl-ether	µg/L			9, 17		637-92-3
tert-Amyl-methyl-ether (butane)	µg/L	EPA 524.2	170	9, 17		994-05-8

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Notes for Tables 3a and 3b

Title 22. California Code of Regulations, California Safe Drinking Water Act and Related Laws and Regulations. February 2007.
<http://www.dhs.ca.gov/ps/ddwem/publications/lawbook/PDFs/dwregulations-02-06-07.pdf>

- [1] Table 64431-A. Maximum Contaminant Levels, Inorganic Chemicals
- [2] Table 64432-A. Detection Limits for Purpose of Reporting (DLRs) for Regulated Inorganic Chemicals
- [3] Table 64442. Radionuclide Maximum contaminant Levels (MCLs) and Detection Levels for Reporting (DLRs)
Picocuries per liter; including Radium-226 but excluding Radon and Uranium.
- [4] Table 64444-A. Maximum Contaminant Levels Organic Chemicals
- [5] Table 64445.1-A. Detection Limits for Reporting (DLRs) for Regulated Organic Chemicals
- [6] Table 64449-A. Secondary Maximum Contaminant Levels "Consumer Acceptance Levels"
- [7] Table 64449-B. Secondary Maximum Contaminant Levels "Consumer Acceptance Levels"
- [8] § 64449(b)(2)
- [9] Table 64450. Unregulated Chemicals
- [10] Appendix 64481-A. Typical Origins of Contaminants with Primary MCLs
- [11] Table 64533-A. Maximum Contaminant Levels and Detection Limits for Reporting Disinfection Byproducts
- [12] § 64670.(c)
- [13] Table 64678-A. DLRs for Lead and Copper
- [14] § 64678 (d)
- [15] § 64678 (e)
- [16] New Federal standard as of 1/23/2006 in 10 ppb
- [17] Dept Health Services Drinking Water Notification Levels (June 2006)
- [18] MFL = million fibers per liter; limited to fibers longer than 10 um.